Igneous Lab Questions pg 29 #1-4

1. Large crystals – slow cooling, thinner magma (all else equal), intrusive, granite, gabbro

Small crystals – fast cooling, thicker magma (all else equal), extrusive, rhyolite, basalt

Glassy – fast cooling, thick magma, obsidian

1. Geode forms when a blob of lava has an air pocket. On the outside of the blob it cools quickly, making a glassy rind. On the inside it is more insulated, so slower cooling, and has space for crystals to form, showing crystal shape.
2. Viscosity is the property. Obsidian is glassy (no crystals) – this usually forms when the thick magma prevents similar atoms coming together to form crystals at all, which felsic typically is.

Fractional crystallization (gravitational settling) – when olivine forms (Bowen’s reaction series) it is very heavy, lots of Mg and Fe, so will sink if the magma is thin enough, which mafic typically is.

1. Xenolith – If a dark (mafic) rock falls into a felsic magma, the felsic magma might not be hot enough to melt the mafic rock (mafic melts at higher temperatures), so when the felsic magma cools down, the mafic rock will be a patch in the felsic rock. If a felsic rock fell into a mafic magma, the felsic rock would melt and mix right in (assimulation).